ENGLISH

LifeVue 15” and 19” Patient Monitoring Displays

Desk Top or Wall Mount

NATIONAL DISPLAY SYSTEMS

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1 *CAUTION*

This symbol alerts the user that important literature concerning the operation of this unit has been included. Therefore, it should be read carefully in order to avoid potential problems.

This symbol warns user that un-insulated voltage within the unit may have sufficient magnitude to cause electrical shock. Therefore, it is dangerous to make contact with any part inside the unit. To reduce the risk of electric shock, **DO NOT** remove cover (or back). ***There are no user serviceable parts inside.*** Refer servicing to qualified service personnel.

To prevent fire or shock hazards, do not expose this unit to rain or moisture. Also, do not use this unit's polarized plug with an extension cord receptacle or other outlets unless the prongs can be fully inserted. The display is designed to meet the medical safety requirements for a patient vicinity device. This device **may not** be used in connection with life support equipment.

Underwriters Laboratories (UL) Classification:
This monitor is a UL Classified product. and meets the medical safety requirements UL 60601-1 for U.S. National requirements, IEC-60601-1 and CAN/CSA no. 60601.1 for Canadian National requirements.

UL Safety Compliance:
LifeVue Medical Display WITH RESPECT TO ELECTRIC SHOCK, FIRE AND MECHANICAL HAZARDS ONLY IN ACCORDANCE WITH UL 60601-1/CAN/CSA C22.2 NO. 601.1 41.

EEC Safety Compliance:
This display unit meets the requirements of EN-60601-1 so as to conform to the Medical Device Directive 93/42/EEC (general safety information).

DEMKO
EN 60601-1

This monitor complies to the above standards ***only*** when used with the supplied medical grade power supply.
12 Volt: Ault MW116 Type KA2400FOX
The monitor should be powered from a center tapped circuit when used in the US at voltages over 120 volts.
Monitor is intended for continuous operation.

This display head has been tested and approved to meet the liquid ingress standard for IPX1.
Notes:
1. The power supply and power switch have not met IPX1.
2. Displays with the optional audio feature installed do not meet IPX1

*This equipment **may not** be used in the presence of flammable anesthetics mixture with air, oxygen or nitrous oxide.*

Recycling:

Follow local governing ordinances and recycling plans regarding the recycling or disposal of this equipment.

Declarations of Conformity

FCC and Council Directives of European Standards:
This device complies with Part 15 of FCC rules and 93/42/EEC of the Council Directives of European Standards. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesirable results.

1. Use the attached specified cables with the color monitor so as not to interfere with radio and television reception. Use of other cable and adapters may cause interference with other electronic equipment.
2. This equipment has been tested and found to comply with the limits pursuant to FCC part 15 and CISPR 11. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications.

IEC:
This equipment has been tested and found to comply with the limits for medical devices to the IEC 60601-1-2:2001. These limits are designed to provide reasonable protection against harmful interference in a typical medical installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to other devices in the vicinity.

FCC, Council Directives of European Standards and IEC:
There is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult your dealer or an experienced radio/TV technician for help.

Accessory equipment connected to this monitor must be certified according to the respective IEC Standards (i.e., IEC 60950-1 for data processing equipment and IEC 60601-1-1 for medical equipment). Furthermore, all configurations shall comply with the system standard, IEC 60601-1-1. Anyone who connects additional equipment to the signal input part or signal output part configures a medical system, and is therefore responsible that the system complies with the requirements of system standard IEC 60601-1-1. Whoever is responsible for securing the monitor to a system needs to insure that the mounting equipment used with this display complies to IEC standard 60601-1. If in doubt, consult the technical services department or your local representative.

Limited Warranty

National Display Systems, Inc. (hereinafter "NDS") warrants this product to be free from defects in material and workmanship and, subject to the conditions set forth below, agrees to repair or replace any part of the enclosed unit other than the LCD backlight, which proves defective for a period of three (3) years from the date of first purchase or 10,000 hours of operation whichever comes first. Spare parts are warranted for ninety (90) days.

This warranty is limited to the original purchaser of the product and is not transferable. This warranty covers only NDS supplied components. Service required as a result of third party components is not covered under this warranty. Proof of Purchase will be required by NDS to substantiate date of purchase. Such proof of purchase must be an original bill of sale or receipt containing the name and address of the seller and the purchaser and the serial number of the product.

It shall be your obligation and expense to have the product shipped, freight prepaid, or delivered to the authorized reseller from whom it was purchased, or other facility authorized by NDS to render services provided hereunder, in the original package. All products returned to NDS for service MUST have prior approval which may be obtained by contacting the factory. The product shall not have been previously altered, repaired, opened or serviced by anyone other than a service facility authorized by NDS to render such service. The serial number of the product shall not have been altered or removed. In order to be covered by this warranty, the product shall not have been subjected to displaying of fixed images for long periods of time, resulting in image persistence (afterimage effects), accident, misuse or abuse or operation contrary to the instructions contained in the User's Manual. Any such conditions will void this warranty.

NDS SHALL NOT BE LIABLE FOR DIRECT, INDIRECT, INCIDENTAL, CONSEQUENTIAL OR OTHER TYPES OF DAMAGES RESULTING FROM THE USE OF ANY NDS PRODUCT OTHER THAN THE LIABILITY STATED ABOVE. THESE WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

The product is warranted in accordance with the terms of this limited warranty. Consumers are cautioned that system configuration, software, the application, customer data and operator control of the system, among other factors, affect the product performance. While NDS products are considered to be compatible with many systems, specific functional implementation by the customers of the product may vary. Therefore, suitability of a product for a specific purpose or application must be determined by consumer and is not warranted by NDS.

About This Manual

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This manual is designed to assist the user with proper installation, setup and operation of the Patient Monitoring LCD displays. The 19" display has a native resolution of 1280 x 1024 (SXGA), and automatically accomodates resolutions from VGA to SXGA. The 15" display has a native resolution of 1024 x 768 (XGA), and automatically accomodates resolutions from VGA to SXGA.

The functional descriptions in this manual are representative of BIOS firmware:
58F0001 A and later for the 15" display.
58F0002 A and later for the 19" display.

This manual applies to:

Model: VC-X15	**Model: VC-SX19**
Part Number:	Part Number:
90M0312	90M0221
90M0315	90M0222
90M0316	90M0225
90M0318	90M0227
	90M0229

Due to the technology utilized to manufacture flat-panel screens, characters will appear crisper with sharper edges than that of a computer CRT. For the same reason, live video may appear a little blocky. Users not familiar with the image differences should familiarize themselves before utilization in a critical application and determine its usability.

For mission critical applications, it's strongly recommend that a replacement unit be immediately available.

Quick Startup

Powering On The Unit:

Connect the power supply to the display via the power plug. Plug in the AC adapter. Connect the video source to the display. Apply power to the peripheral device, then to the display. The National Display Systems (NDS) logo is displayed, followed shortly by video.

The electronics, designed by NDS, incorporates proprietary SmartSync™ technology which at initialization, examines the incoming signal and automatically displays the video image in its proper format. This eliminates making adjustments to most video sources. To fine tune the image, please refer to "Image Adjustments" .

First time users and initial test:

Visually, Flat-Panel (LCD) images will look crisper than those of a traditional CRT. It is recommended that first time users view the display next to a CRT to familiarize themselves with any differences in viewing quality.

Connector Panel

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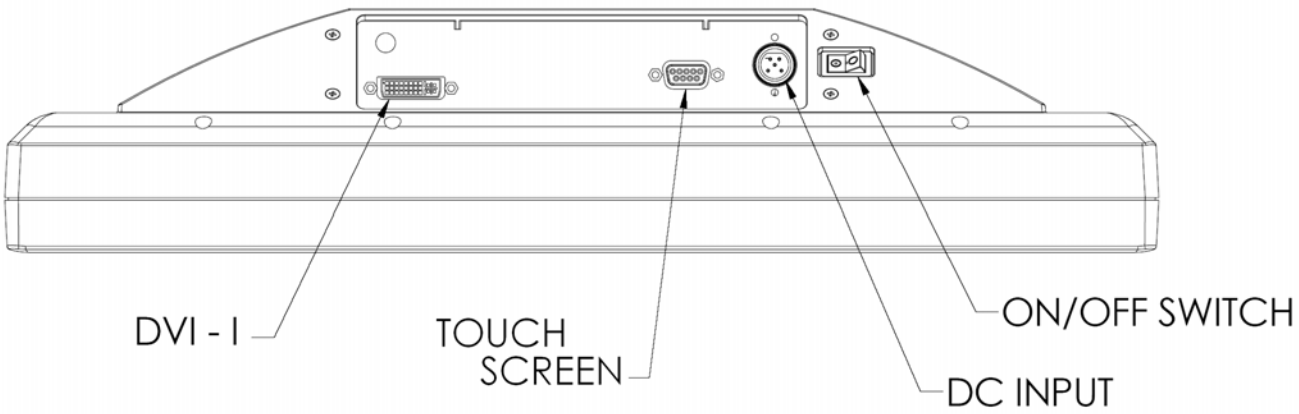


Note: Touch Screen connector is available on Part Numbers:

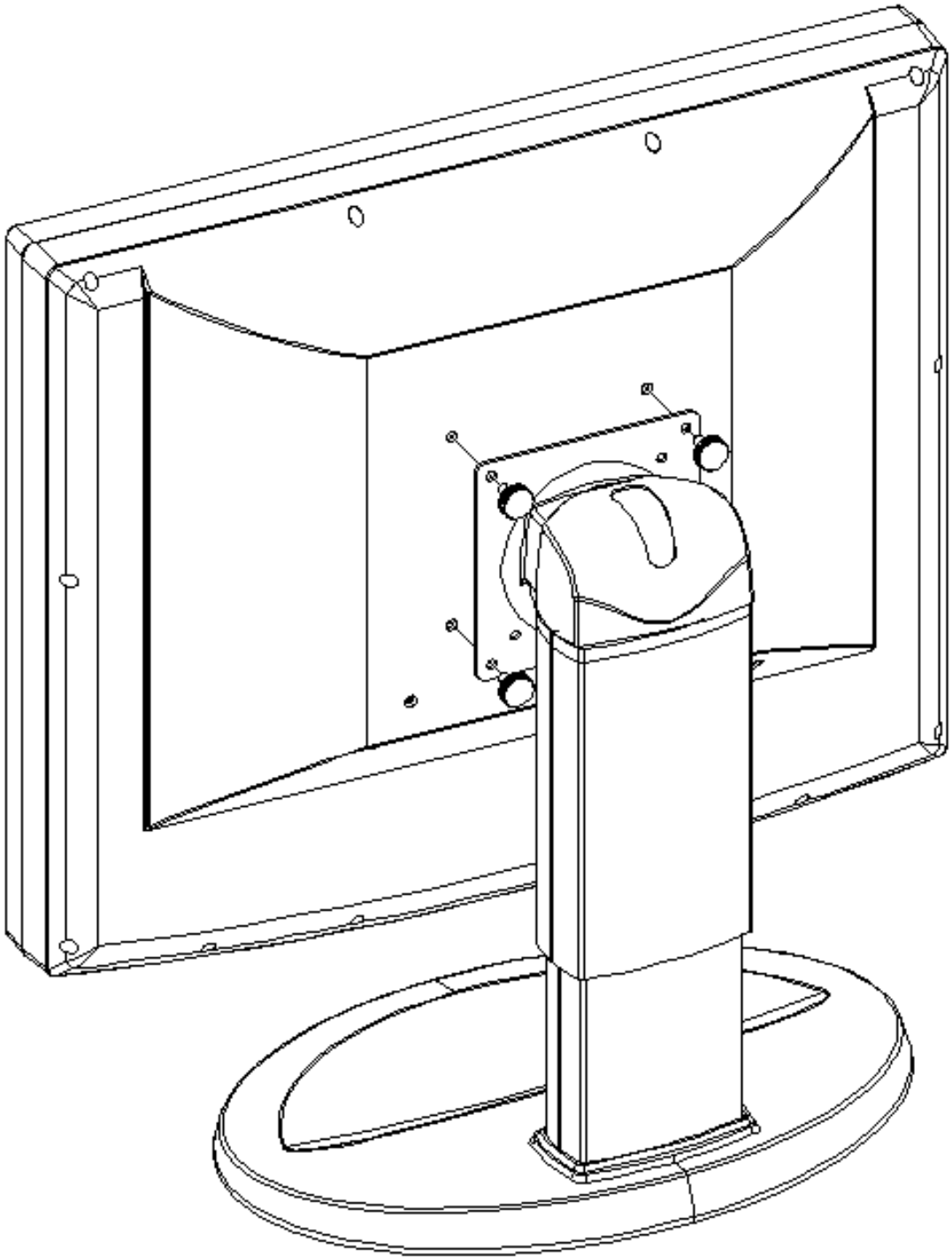
Model VC-X15	**Model VC-SX19**
90M0312	90M0221
90M0316	90M0225
90M0318	90M0227

Mounting Display to the Adjustable Stand

Attach the stand to the display using the four supplied thumbscrews.

Note:
Display Stand is an optional accessory.

Description	Part Number
Adjustable Height	26B0063
Fixed Height	26B0064

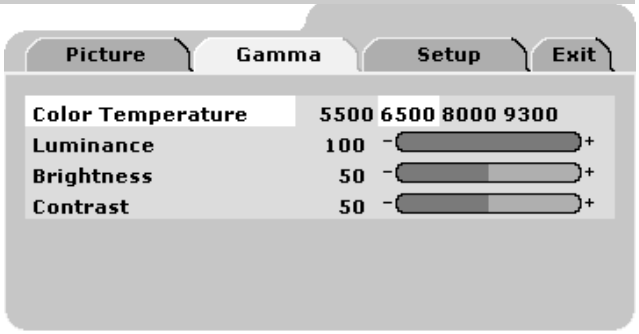


Control

The Patient Monitoring displays are controlled via a 3 button keypad. The keypad, located on the back of the display, allows the user to make adjustments to various display parameters using the On Screen Menus (OSM) system.

Image Adjustments

Gamma Menu



Press the MENU button once to open the OSM. Press the ▶ button to select the Gamma menu, then press the MENU button to select the parameter to be adjusted. Finally, press the ◀ or ▶ button to set the parameter to the desired value.

Color Temperature
Press the ◀ or ▶ button to select one of the four preset color temperatures. The selected color temperature will be highlighted in white.

Luminance
Press the ◀ or ▶ button to set the backlighting. **Note:** Lowering the backlight level will increase the backlight lifetime.

Brightness
Press the ◀ or ▶ button to increase or decrease brightness. Setting the brightness too high or too low will decrease the amount of visible grayscales.

Contrast
Press ◀ or ▶ button to adjust the contrast. Contrast set too high or too low causes loss of some grayscales. Color saturation may appear incorrect.

Menu Systems Overview

Press the MENU button once to open the Menu System. The current video input is shown in the Display Mode tab on the top right of the menu. The Menu System opens with Picture menu displayed. Press the ◀ or ▶ button to select the menu you want to work with, then press the MENU button to select the parameter. Press the ◀ or ▶ button to set the parameter to the desired value. Press the MENU button until the cursor returns to the menu tabs, then press the ◀ or ▶ button until the Exit tab is illuminated. Press the MENU button to select the Exit parameter, then press the ▶ button to save your changes and close the Menu System.

If not explicitly closed, the OSM will automatically close 60 seconds after the most recent button press.

Note: All parameter names change to the language selected in the Setup Menu.

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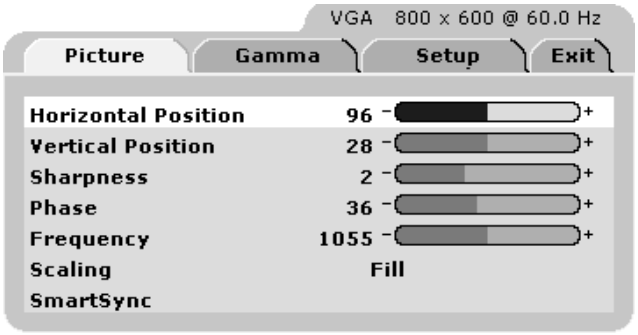
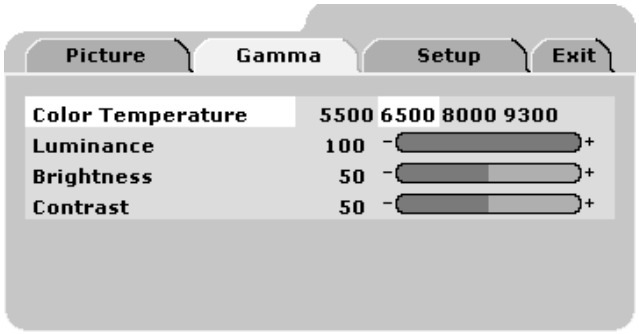
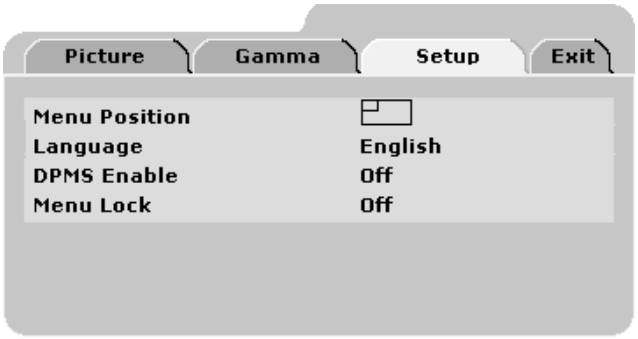
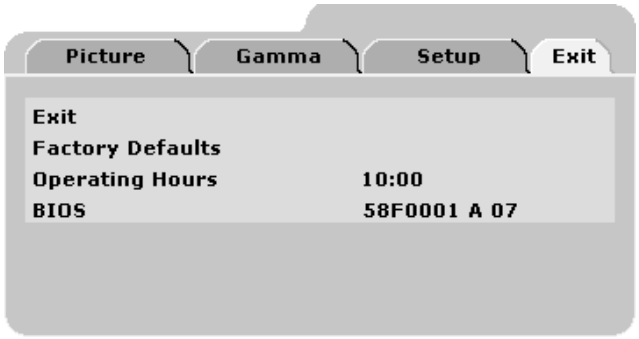








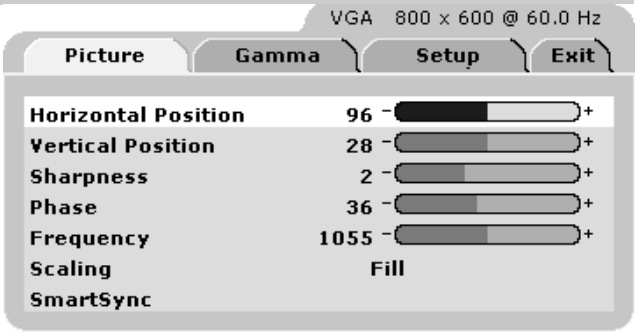
Language List:

English
Deutsch
Dutch
Espanol
Francais
Italiano
Scandinavia

Setting Up the Display

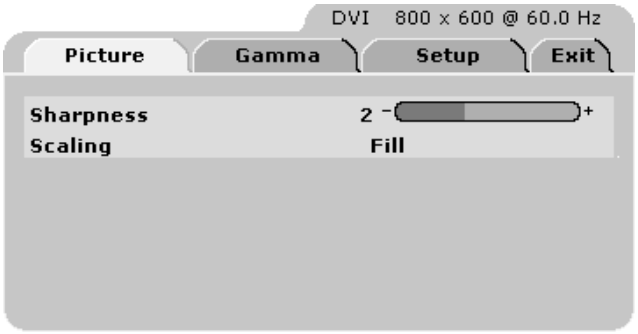
VGA Picture Menu

Applies to all models



DVI Picture Menu

Applies to Part Numbers: 90M0221, 90M0222, 90M0225, 90M0227 and 90M0229



Horizontal Position
Moves the image to the left or right. Press ◀ or ▶ to horizontally center the image. **Note:** This parameter is not accessible when the data source is DVI - digital.

Vertical Position
Moves the image up or down. Press ◀ or ▶ to vertically center the image. **Note:** This parameter is not accessible when the data source is DVI - digital.

Sharpness
Press ◀ or ▶ to adjust the sharpness (focus) of the displayed image. **Note:** The Sharpness control is not visible when the display is operating at native resolution.

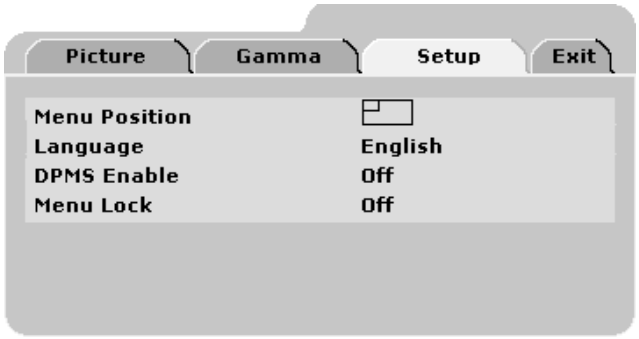
Phase
Press ◀ or ▶ to adjust the phase of the display's pixel clock. The phase adjustment further refines the pixel clock (frequency) adjustment. **Note:** This parameter is not accessible when the data source is DVI - digital.

Frequency
Adjusts the frequency of the display's pixel clock to insure that all pixels of a given scan line are displayed in the appropriate column. With Scaling set to **Fill** adjust until image just fills the screen horizontally. Press ◀ or ▶ to adjust the frequency of the display's pixel clock. **Note:** This parameter is not accessible when the data source is DVI - digital.

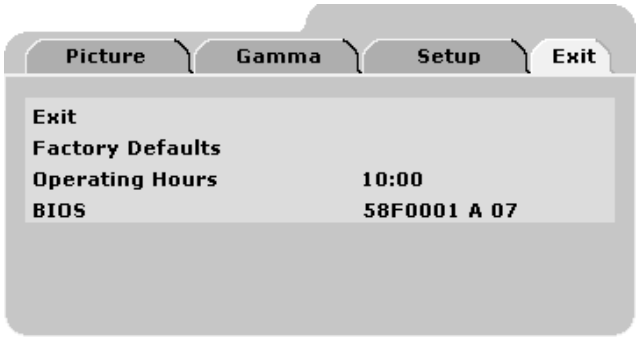
Scaling
Fill = Expands the video image to fill the entire screen. The aspect ratio may not be accurately displayed.
Aspect = Expands the video image until its largest dimension fills the screen. Image may be displayed with black bars. Select using ◀ or ▶ buttons.

SmartSync™
On initialization NDS' proprietary SmartSync™ technology examines the incoming signal and automatically displays the video image in its proper format. To run select SmartSync™ and press the ▶ button.

Setup Menu



Exit Menu



Menu Position
Places the menu in 1 of 9 predefined screen positions. Press the ◀ or ▶ button to select any of the 9 screen positions.

Language
Selects 1 of 7 languages: English, Deutsch, Français, Italiano, Svensk, Español or Nederlands. Press the ◀ or ▶ button to select any of the 7 languages.

DPMS Enable
Display Power Management System. When DPMS is enabled (on), and no input signal is present, an "No Input Detected" message is displayed for ~ 20 seconds, after which the display enters its low power state. This prolongs the life of the backlight tubes in the display. The display turns on when the input signal is restored. Press the ▶ button to enable DPMS, press the ◀ button to disable DPMS.

Menu Lock
Disables access to menu system. This prevents inadvertent changes to the display's settings. To enable Menu Lock, press the ▶ button. MENU LOCKED is displayed when the ▶ button is pressed. To unlock, press and hold the ◀ and ▶ buttons simultaneously until MENU UNLOCKED is displayed.

Exit
Exits menu system. Select Exit, then press the ▶ button.

Factory Defaults
Displays "Restoring Factory Defaults" message and returns all settings to their factory preset values. Select Factory Defaults, then press the ▶ button.

Operating Hours: Backlight hours of operation.

BIOS: Version of the display's BIOS firmware.

Troubleshooting Section

Image Size is Very Large for the Screen

If the computer data does not appear to be the correct format, then SmartSync™ must be run. To run SmartSync™, press the Menu button. Select the Setup menu. Press SCROLL to highlight SmartSync™ , then press the ▶ button. SmartSync™ will run and size the image properly.

Ghosting in Characters

Ghosting in characters is usually attributed to reflections in the video cable or source. Use a high quality video cable and, if possible, lower the vertical refresh rate. Lower scan rates can help eliminate reflections. Unlike a CRT a flat-panel will not flicker at lower refresh rates (60 Hz is optimal) and data update will be the same at all refresh rates.

Text is Too Small

Since the monitor accepts and displays computer data with a higher resolution than the display's native resolution, this may produce small text. In the Menu check the Display Mode tab. Verify that the computer data resolution does not exceed the Native Resolution specification shown on page 12.

Character Jitter

If text characters seem to be "shaky" or bold, then Sharpness, Frequency and / or Phase may require adjusting. See: *Setting Frequency, Phase and Sharpness* below.

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Character Noise and Vertical Distortion

The Frequency adjustment expands or contracts the horizontal size of the displayed image. The displayed image may be too wide or too narrow and vertical banding and pixel jitter may appear in grays and light colors. Adjust the Frequency until the image just fits the screen. Horizontal position adjustment can be used to verify that Frequency is set correctly. Line up the image on the left edge of the screen and then shift by one "click" to the right. The image should have one column off the screen on the right side if the Frequency is set correctly.

Black Screen

Power the display Off and On. If the NDS logo appears then the display is working properly. Check if the power management feature (DPMS) is enabled. An "Out of Range" message appears in the upper left hand corner when an input source is out of the display's resolution range. A "Searching" message appears in the lower right hand corner when the video source is not present.

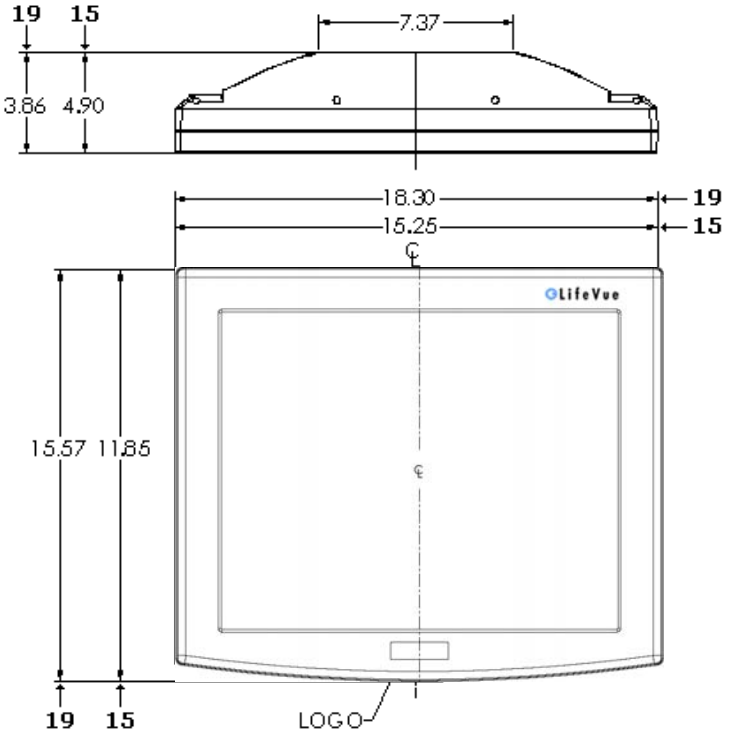
Setting Frequency, Phase and Sharpness

Windows Users: Open a WordPad document and set the font to Arial 8. Press the enter key to move the cursor to the middle of the page. Hold the shift and + keys down to create a line of +s.

If the + signs appear in groups of light or dark, then the Frequency is not correct. Press the MENU button to open the OSM, then SCROLL to the Frequency parameter. Press the ◀ or ▶ buttons to increase or decrease Frequency. There will be a point were all the + signs snap into focus and are the same intensity.

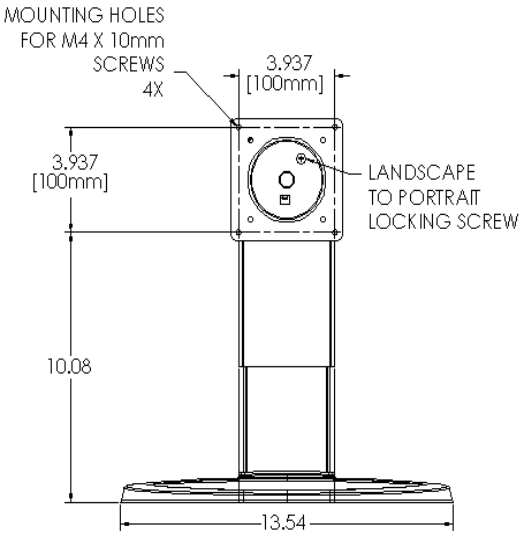
Phase and Sharpness are subtle adjustments and are best set using a display calibration program.

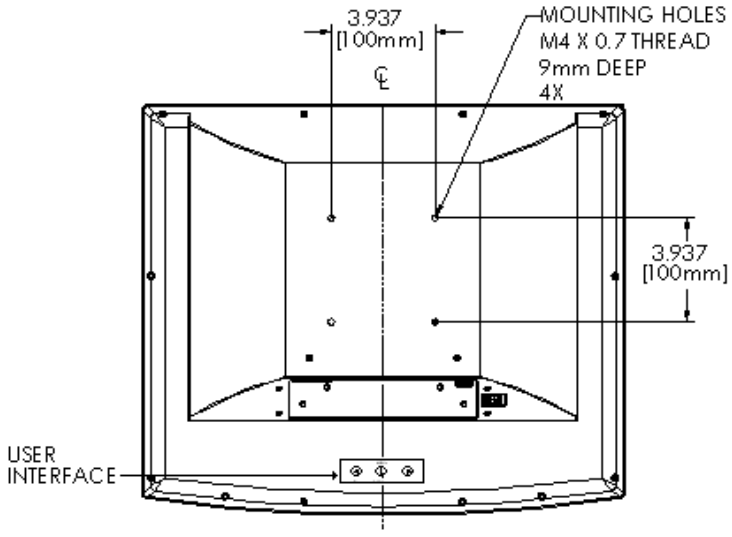
Drawing and Dimensions

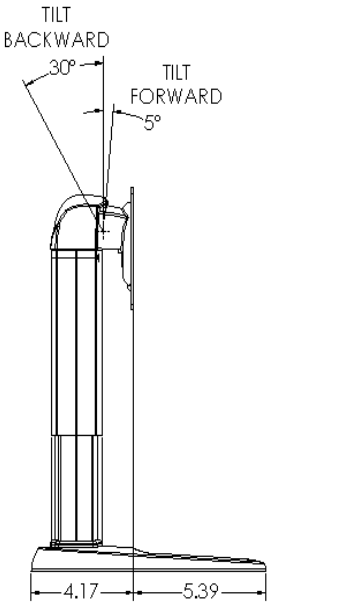


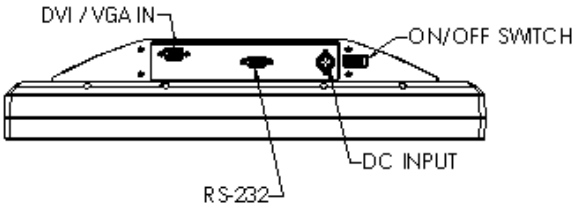
Display Stand is an optional accessory.

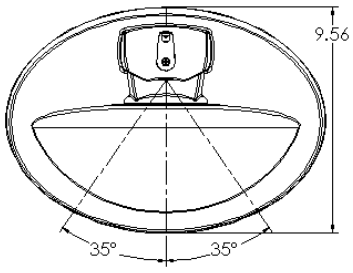
Description	Part Number
Adjustable Height	26B0063
Fixed Height	26B0064











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Data Connectors and Pin Outs

Notes:
1. Part Numbers: 90M0312, 90M0315 and 90M0316 have a VGA connector.
2. Part Numbers: 90M0221, 90M0222, 90M0225, 90M0227 and 90M0229 have a DVI-I connector.
3. The part number is found on the label affixed to the back of the display.

VGA

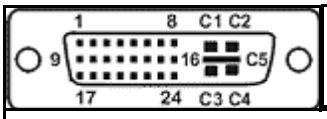
1 RED	6 GND RED	11 ID0
2 GREEN	7 GND GREEN	12 ID1
3 BLUE	8 GND BLUE	13 HORIZ SYNC
4 ID2	9 N. C.	14 VERT SYNC.
5 GND	10 SYNC GND	15 ID3

Touch Screen

Pin	Name	Description
1	N/C	
2	RXD	Touch Screen Receive
3	TXD	Touch Screen Transmit
4	N/C	
5	GND	Ground
6	N/C	
7	N/C	
8	N/C	
9	N/C	

Note: The following cables are available from NDS.

1. Touch Screen Cable order part number: 35D0003

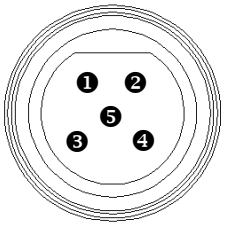


DVI-I
Digital and Analog (VGA).

DVI-I Supports digital **and** analog (VGA). Analog data appears on pin 8 and pins, C1 through C5.

PIN#	SIGNAL	PIN#	SIGNAL
1	T.M.D.S. DATA 2-	**16**	HOT PLUG DETECT
2	T.M.D.S. DATA 2+	**17**	T.M.D.S. DATA 0-
3	T.M.D.S. DATA 2/4 SHIELD	**18**	T.M.D.S. DATA 0+
4	T.M.D.S. DATA 4-	**19**	T.M.D.S. DATA 0/5 SHIELD
5	T.M.D.S. DATA 4+	**20**	T.M.D.S. DATA 5-
6	DDC CLOCK	**21**	T.M.D.S. DATA 5+
7	DDC DATA	**22**	T.M.D.S. CLOCK SHIELD
8	ANALOG VERT. SYNC	**23**	T.M.D.S. CLOCK+
9	T.M.D.S. DATA 1-	**24**	T.M.D.S. CLOCK-
10	T.M.D.S. DATA 1+		
11	T.M.D.S. DATA 1/3 SHIELD	**C1**	ANALOG RED
12	T.M.D.S. DATA 3-	**C2**	ANALOG GREEN
13	T.M.D.S. DATA 3+	**C3**	ANALOG BLUE
14	+5V POWER	**C4**	ANALOG HORIZ SYNC
15	GND	**C5**	ANALOG GROUND

Power Connector and Pin Out



12 volt connector					
Pin	1	2	3	4	5
	GND	GND	+ 12 VDC	Shield	+ 12 VDC

Specifications[1]

Model	VC-X15-wxyz	VC-SX19-wxyz
Viewable Diagonal (inches)	15.0	19.0
Brightness (cd/m², typical)	250 [2]	450 [2]
Native Resolution	1024 x 768	1280 x 1024
Dot Pitch (mm)	.30	.28
Vertical Viewing Angle	160°	170°
Horizontal Viewing Angle	160°	170°
Contrast Ratio (typical)	400:1	400:1
VGA Input signal level at 75Ω	0.7 V p-p	0.7 V p-p
Environmental		
Power Consumption (nominal)	28w	43w
Weight, Display	9.4 lbs (4.26 kg)	14.0 lbs (6.35 kg)
Weight, Stand	8.5 lbs (3.85 kg)	8.5 lbs (3.85 kg)
Operating Temperature	0 to 40°C	0 to 40°C
Storage Temperature	-20 to 60°C	-20 to 60°C
Relative Humidity (non condensing)	5-90%	5-90%

Notes:
1. Specifications are subject to change without notice. Contact factory for recent specifications.
2. Without Touch Screen or A/R filter.

Proprietary Notice and Liability Disclaimer:

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Cleaning Instructions:

Follow your hospital's protocol for the handling of blood and body fluids. Clean the display with a diluted mixture of mild detergent and water. Use a soft towel or swab. Use of certain cleaning agents may cause degradation to the plastic enclosure and labels of the product. The plastic is ABS. Consult cleanser manufacturer to see if agent is compatible with it. Do not allow liquid to enter the display.

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